

REMARKS

Claims 1-3, and 5-12 are pending herein.

I. The claim Rejections under 35 U.S.C. §102.

Claims 1-7 and 11-12 stand rejected under 35 U.S.C. §102(e) as being anticipated by Kelkar (U.S. Patent No. 6,646,789).

A. Kelkar does not disclose an optical signal of a semiconductor laser being directly modulated with an analog electric signal, as claimed in claims 1.

Regarding the limitations of claim 1 that claim in relevant part:

“wherein said optical fibers transmit an optical signal of a semiconductor laser being directly modulated with an analog electric signal;” (emphasis added)

it is respectfully not seen where Kelkar discloses the claimed structure quoted above.

No new matter is introduced by these amendments. Support for the amendments can be found on page 2, lines 3-15 and page 5, lines 4-19 of the present specification. Specifically, page 2 discloses directly modulating an optical signal of a semiconductor laser. Page 5 of the present specification discloses an analog electric signal. Thus, the claimed structure quoted above transmits an optical signal of a semiconductor laser being directly modulated with an analog electric signal, as claimed in claim 1.

In contrast, Kelkar is directed to wavelength division multiplexing (WDM), which is different from being directly modulated with an analog electric signal, as claimed in claim 1.

Furthermore, and contrary to the apparatus claimed in claim 1, Kelkar is directed to gain flatness of WDM optical signals in an optical amplifier. In other words, Kelkar is only concerned with differences in powers of WDM signals that are outputted from the optical amplifier within specific value from the desired gain profile.

Thus, it is respectfully asserted that Kelkar does not disclose all the elements of the claimed structure quoted above. Therefore, it is respectfully asserted that Kelkar does not anticipate claim 1.

B. Kelkar does not disclose a gain slope compensation optical filter for flattening a gain slope, wherein the gain slope is calculated by first order differentiation as a function of wavelength, as claimed in claim 1.

Regarding the limitations of claim 1 that claim in relevant part:

“wherein, said optical filter comprises a gain-slope compensation optical filter for flattening a gain slope ($dG/d\lambda$, where G:gain, λ :wavelength), wherein the gain slope is calculated by first order differentiation as a function of a wavelength”

it is respectfully not seen where Kelkar discloses the claimed structure quoted above.

No new matter is added by the amendments. Support for the amendments can be found on page 15, lines 9-12 of the present specification. Specifically, page 15 of the present specification discloses that the gain slope of the input signal wavelength is calculated by first order differentiation, as claimed in claim 1.

In contrast, it does not appear that Kelkar teaches gain slope calculated by first order differentiation. Rather, the “gain slope” as defined in Kelkar only appears to show a trend of gain/wavelength in WDM signals because it only defines one value for “gain slope” in a desired wavelength band. This is different from a gain slope calculated by first order differentiation, as claimed in claim 1.

Applicants have respectfully included annotated Figure A with this Amendment to further illustrate the differences between Kelkar and the apparatus claimed in claim 1 regarding the gain slope. Applicants respectfully note that this attached Figure is for background information and the Examiner’s convenience only, and it is not intended to become part of the drawings of the application.

Thus, it is respectfully asserted that Kelkar does not disclose all the elements of the claimed structure quoted above. Therefore, it is respectfully asserted that Kelkar does not anticipate claim 1.

C. Importance of the differences noted above.

The specifically claimed structures quoted parts A and B provide important and non-trivial advantages. For example, signal distortion is generated by interaction with wavelength dependent gain (i.e., gain-slope) due to a chirp of signal light, which occurs in the case of using signal light source of direct modulation means (see page 3 lines 11-15 of the present specification for further explanation).

Additionally, when an analog signal is directly modulated, a wavelength of a signal source is not the same because of piece-to-piece variations of semiconductor lasers. Conventionally, a wavelength range in which a gain slope is controlled is limited (see present Figure 9). Contrary to the conventional practice as illustrated by present Figure 9, which gives only limited wavelength range reducing signal distortion caused by chirp, the present invention makes it broader by maintaining the first derivative substantially zero, making it possible that a single optical amplifier can be used even when wavelengths of signal sources are different.

Thus, a band that is amplified by a single optical amplifier is limited. Therefore, if different signal wavelengths are to be used, several types of optical amplifiers must be arranged. The specifically claimed structures quoted above make it possible to use a single optical amplifier even when wavelengths of signal sources are different.

Thus, the flattening of the gain slope in Kelkar and that of the present invention are different from each other, and Kelkar does not disclose nor suggest the technical features of the present invention.

D. The rejection to claim 11.

Similar to claim 1, claim 11 claims an optical signal of a semiconductor laser being directly modulated with an analog electric signal and a gain slope calculated by first order differentiation as a function of a wavelength. As noted above, it is respectfully asserted that Kelkar does not disclose these elements. Thus, for the reasons discussed above, it is respectfully asserted that Kelkar does not anticipate claim 11.

E. Summary.

In light of the above arguments, it respectfully appears that Kelkar does not disclose all the claimed elements of claims 1 and 11. Thus, the flattening of the gain slope in Kelkar and that of the present invention are different from each other, and Kelkar does not disclose the technical features of the specifically claimed apparatus and method. Therefore, it is respectfully asserted that Kelkar does not anticipate claims 1 and 11.

II. The claim Rejections under 35 U.S.C. §103.

Claims 8-10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kelkar in view of Payne (U.S. Patent No. 5,260,823).

Similar to claim 1, claims 8 and 9 claim an optical signal of a semiconductor laser being directly modulated with an analog electric signal and a gain slope calculated by first order differentiation as a function of a wavelength. As noted above, it is respectfully asserted that the primary reference Kelkar does not disclose these elements.

Additionally, Payne also respectfully appears to be directed to a WDM optical amplifier, and Payne only appears to disclose a technical feature by which a gain peak of 1530 nm is deleted by a filter. Furthermore, Payne respectfully does not appear to teach or suggest the above-mentioned deficiencies in Kelkar, specifically an optical signal being directly modulated with an analog electric signal and a gain slope calculated by first order differentiations.

Thus, it is respectfully asserted that the cited references, taken either alone or in combination, do not teach or suggest all the claimed elements of claims 8 and 9. Therefore, it is respectfully asserted that claims 8 and 9 are not obvious over the cited references.

III. The dependent claims.

As noted above, it is respectfully asserted that independent claims 1, 9, and 11 are allowable, and therefore that dependent claim 2-3, 5-7, 10, and 12 are also allowable.

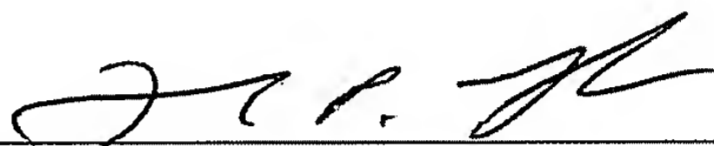
IV. Conclusion.

Reconsideration and allowance of all of the claims is respectfully requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Please contact the undersigned for any reason. Applicants seek to cooperate with the Examiner including via telephone if convenient for the Examiner.

Respectfully submitted,

By 

Daniel P. Lent

Registration No. 44,867

CANTOR COLBURN LLP

55 Griffin Road South

Bloomfield, CT 06002

Telephone (860) 286-2929

Facsimile (860) 286-0115

Customer No. 23413

Date: September 22, 2006